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Thirdly, We met lately with a Body, which being opened, the Liquor, which is contain'd in the *Pericardium*, or the Bag of the Heart, was found congealed into a consistence fit to be cut with a Knife, and two square fingers thick about the Heart. I know not, whether this Observation be rare: But it is time to conclude with the assurance of my being, &c.

At Montauban,  
Dec. 4. 1669.

## A N O B S E R V A T I O N

of *M. Adrian Azout*, a French Philosopher, made in Rome (where he now is) about the beginning of this Year 1670. concerning the Declination of the Magnet: Out of an Italian printed Paper, English'd by the Publisher, as follows.

**T**He Declination of the Load-stone hath for many Years been observ'd not to continue alwayes the same in the same places; and the Variation to be such, that it can be no longer imputed to any defect in the Observations, as it was believed at first, when it was not very great: It hath been noted, some Years since, that the Magnetick Needle, which almost everywhere had declin'd Eastward to 8, 10, and 12 degrees (as may be seen in *P. Kircher*, and *P. Riccioli*) after its diminishing little by little as far as to the Meridian, began to decline West-ward.

*M. Adrian Azout*, a great Searcher of the more considerable Effects of Nature, hath made here in Rome the following Observation about the Declination of the Load-stone, on many Meridian lines drawn as exactly as possibly he could (in a place, where he hath not all the conveniency for this performance) with a Needle, three quarters of a Palm \* long; and on all the lines it was seen to decline somewhat more than two degrees West-ward, and on some, near two degrees and an half.

And that the Observation might be the surer, he drew parallel Lines in divers places, to see whether there were any Iron or Bricks near the Marble, on which he had described the Lines, that might have some influence upon the Needle;

dle ; but he alwayes found the same quantity of Declination West-ward.

But by the Observations, here made formerly, it appears, that the Needle hath declin'd *East-ward* to 8 degrees, and hath afterwards been diminishing, until 'tis come to the other part, where we find it at present. The Observations, that may be made hereafter, will shew how far the Declination will advance towards the West, and what will happen after its greatest elongation ; it not being probable, it should encrease alwayes, and make a whole turn.

It seems not, that this difference of *ten* degrees and more can be attributed to the change of the Pole of the Earth, as some esteem'd, perhaps before they knew it was so great ; nor (as others would have it) to the Magnet, or to the Iron, that are found in certain places, because there is but little Load-stone ; and Mr. *Auzout* affirms, that the Mines, which he hath seen, make no impression at all on the Needle. So that 'tis difficult to hit the true cause of such a Variation : Yet however, if the direction of the Magnet, and of the Needle touched by it, depends from the flux of a certain matter, passing through the whole Earth, or the exterior parts of it, strait along the *Axis* ; it may be said, that it proceeds from changes made in the said flux, which, supposing the inequalities of the Earth, and the alterations continually made therein, as well artificial, by excavations and such like other works, as Natural, by corosions caused by fire and water, or by the generation of Metta's and Stones ( besides the various changes, we cannot think of by reason of the little knowledge we have of so vast a Body as the Earth ) cannot but in progress of time change its situation. To illustrate this with an Example taken from Rivers ; They, although they were running strait, cannot remain long without winding, and changing their course, if it happen, that the ground, over which they run, be unequal, or of a different nature. So 'tis probable, that the inequalities of the Earth may in time occasion some bending in the current of this Magnetick matter, and make it change its bed and channel : Whence it comes to pass, that the Needle changeth its direction according as the Current changeth, which directs it. And if you will consider the variety of

motions,

motions, seen in Rivers because of the higher or lower grounds, which are found in their Beds, and cause various windings and whirlings in them, possibly a reason may be rendred of the many differences, observ'd in the Declination of the Needle ( *e. g.* why in some parts the Needle varies much in a little time ; why, in others, it is alwayes turning without any stay, as some say they have observ'd ; why the greater alterations are met with at the entring into, and going out of Islands ? ) and of many other things, we for brevities sake pass by ; as we also omit to deduce from it divers particulars relating to Navigation.

Which if it should be so, there would be no hopes of finding a regular Hypothesis for that change, forasmuch as it would depend from causes that have no regularity at all in them, as most of the mutations of Nature are. You may only take notice, that if there be a proportion between the force of the said Current, and the Earth, *that* may be able by changing its Bed, to remove *this* from its proper site: Which would produce an alteration in the height of the Pole, as some think they have observ'd, if *that* may not be ascribed to a defect in the Observations, of which we may be rendred certain, when more exact ones shall have been made. And so, whereas others would impute the various Declination of the Magnet to the change of the Pole, we should be obliged to attribute the change of the Pole to the various Declination of the Magnet.

From this Observation, which was thought fit to be publisht here, Mathematicians are invited from time to time to make the like in their Countries, to see, whether in this change there be any regularity. If it had been observ'd every Year, we should already know the progress thereof, and see, whether there were an Uniformity, and in what time the Needle did exactly respect the Pole. Wherefore it were very desirable, that for the future, they would use greater care and diligence, in making most exact Meridians, as well for their own Observations, as for the conveniency of those, who in their Travels shall have the curiosity of observing with the Needle it self, as M. *Auzout* designed to do in the Cities where he pass'd, if he had found Meridians there,

there, or such as had been unsuspected of the proximity of Iron.

It were well to observe, Whether the Declination, which almost through all *Europe* hath been *Eastward*, be now everywhere *Westward*? As also, Whether in *America*, where the Declination was almost every where *Westward*, it be increased or no proportionally; and so of other parts of the World? Noting withall the Year; which is not at all minded by some, who relate the Observations, without assigning the Year, in regard it will be very useful, to know the present Declination; and it might be put in Journals, for Navigation, and for the use of Magnetick Quadrants.

*So far this Relation: In pursuance of which, Order hath been given by the Royal Society, that precise Meridians be made in several places of England; for observing the present Declination of the Needle from them, here in London, and other Cities of this Kingdom: And that even those Meridians, that were made very exactly many Tears ago be examin'd by a careful describing of new ones, to see whether they still hold true, in regard of the suspected alterations in Nature.*

*If any shall inquire after the Manner of finding the Variation of the Needle, he will find several wayes of doing it accurately, both by Sea and Land; in Numb. 4. of these Tracts; where also the great usefulness of making exact Observations of this kind, is taken notice of, both for the discovery of the true Cause of the Magnet's Verticity, and for the finding the Longitude at Sea.*